Making olive oil sustainable

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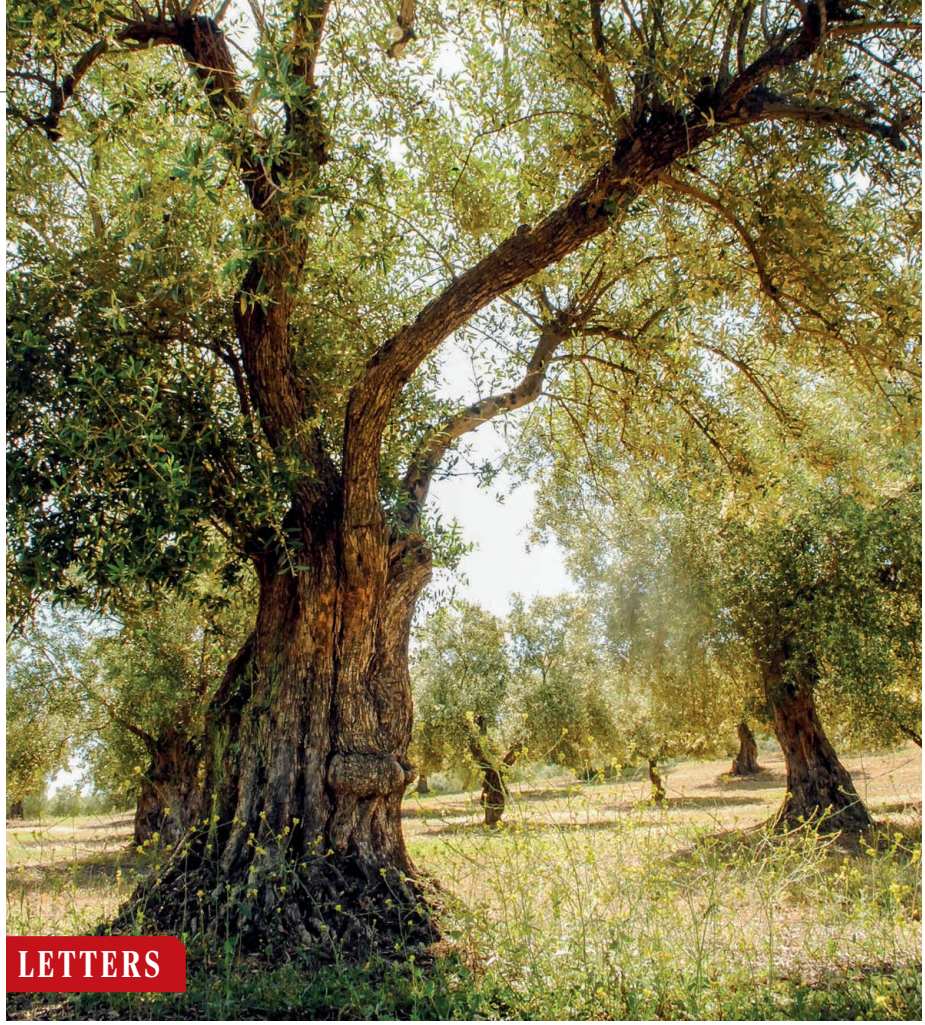

The environmental value of traditional olive groves, such as this one in Portugal, has been overlooked.

PHOTO: NEREIDA MELGUIZO-RUIZ

Edited by **Jennifer Sills**

Making olive oil sustainable

Traditional olive groves, typical of Mediterranean landscapes, date back at least to the ancient Greek civilizations (*1*) and hold cultural, scenic, and biodiversity value (*2*). However, as demand for olives and olive oil has increased (*3*), traditional groves, the least viable in economic terms, have been abandoned and production has shifted to large-scale intensive plantations to maximize yields (*3*–*5*). These vast groves use irrigation, high tree densities, agrochemicals, and mechanization (*6*). The resulting landscape simplification and habitat loss and degradation contribute to substantial biodiversity decline (*6*, *7*). There are also claims that harvesting olives at night leads to mass bird mortality (*8*) and that the olive industry affects water, soil, and human health (*5*).

A thorough understanding of the environmental impacts of modern olive farming is urgent to inform agricultural policies and consumers. In the European post-2020 agricultural policy proposal (*9*), currently under discussion, most farmers are required to comply with basic environmental standards. However, the olive sector is exempted from environmental requirements (*10*). This should be changed in order to promote the maintenance of traditional olive groves, limit the area occupied by continuous olive tree monocultures, and introduce environmentally friendly management practices. Because organic production labels focus mostly on fertilizers and pesticides, they do not provide enough information to consumers. To facilitate informed choices, new labels should be created. Olive oil packaging should provide consumers with details about the grove from which the product was sourced. Biodiversity-rich groves that host rare species of plants and animals could benefit from this marketing. Enhancing and highlighting the sustainability of olive farming are important not only for the environment but also for the economic revenues of olive oil producers.

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Will DNA barcoding meet taxonomic needs?

In her In Depth News story "DNA barcodes jump-start search for new species" (7 June, p. 920), E. Pennisi celebrates a global effort to identify 2 million new species and suggests that a "golden era" for biodiversity science is about to begin. The effort is mainly driven by an injection of $180 million toward sequencing short DNA segments that distinguish species—DNA barcodes—across a wide diversity of multicellular species, both in the field and the laboratory. The commendable goal is to document new species before they disappear, and the effort will undoubtedly find at least as many new species as they estimate. However, the massive gap in our taxonomic knowledge is not a problem of finding new species but rather a delay in formally describing them (*1*).

Natural history museum collections already house a substantial amount of the biodiversity awaiting formal description, including specimens of species likely to be "discovered" through the proposed DNA barcoding effort. Although DNA can be an invaluable tool for identifying new species, formal descriptions provide the names and accounts of anatomy, biology, and provenance that make species visible and useful to the scientific community and to the resource managers who aim to protect and conserve biodiversity. Additionally, taxonomy requires context and expertise, including comparisons to previously documented species for which DNA sequences have yet to be obtained.

The current average shelf life of new species between discovery and description is

estimated at 21 years (*2*). This slow pace and ever-increasing backlog are the result of the decreasing number of taxonomists and the lack of financial investment in the field of taxonomy and museum collections (*3*). Many megadiverse groups, including less charismatic plants, fungi, and invertebrates, have very few or no specialists with the necessary knowledge to describe them, whereas most scientists study charismatic groups and dedicate their time to ecological and evolutionary science (*4*). Without support for proper long-term housing and morphological descriptions, which is what is required to officially name a species under the rules of the International Codes of Nomenclature (*5*), species identified by DNA barcode will likely just add to the already massive backlog.

The lack of investment in natural history collections and research worldwide is clear and especially apparent in developing countries (*6*) that hold most of the biodiversity on our planet. Many new species that might be at risk of extinction in nature have the same risk of disappearing from museum shelves due to the lack of maintenance (*6*). DNA barcodes alone are not enough to document the biological diversity. Overcoming the taxonomic backlog can lead to incredible advances in conservation and biodiversity science, but this will only happen if governments, societies, and institutions recognize and invest in taxonomists, museum collections, and their staff.

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Trophy hunting bans imperil biodiversity

Trophy hunting is under pressure: There are high-profile campaigns to ban it, and several governments have legislated against it (*1*). In the United States, the CECIL Act (*2*) would prohibit lion and elephant trophy imports from Tanzania, Zambia, and Zimbabwe and restrict imports of species listed as threatened or endangered on the Endangered Species Act. Australia, the Netherlands, and France have also restricted trophy imports (*1*), and the United Kingdom is under pressure to follow. Calls for hunting bans usually cite conservation concerns. However, there is compelling evidence that banning trophy hunting would negatively affect conservation.

In African trophy hunting countries, more land has been conserved under trophy hunting than under national parks (*3*), and ending trophy hunting risks land conversion and biodiversity loss (*4*). Poorly managed trophy hunting can cause local population declines (*5*), but unless better land-use alternatives exist, hunting reforms—which have proved effective (*6*)—should be prioritized over bans (*7*). Positive population impacts of well-regulated hunting have been demonstrated for many species, including rhinos, markhor, argali, bighorn sheep, and many African ungulates (*7*).

Banning trophy hunting can have unintended consequences for species such as lions.

Trophy hunting can also provide income for marginalized and impoverished rural communities (*7*). Viable alternatives are often lacking; opponents of hunting promote the substitution of photo-tourism, but many hunting areas are too remote or unappealing to attract sufficient visitors (*8*). Species such as lions fare worst in areas without photo-tourism or trophy hunting (*9*), where unregulated killing can be far more prevalent than in hunting zones, with serious repercussions for conservation and animal welfare (*10*). Focusing on trophy hunting also distracts attention from the major threats to wildlife.

The International Union for Conservation of Nature (IUCN), a global conservation authority, clearly concludes that "with effective governance and management trophy hunting can and does have positive impacts" on conservation and local livelihoods (*7*). Although there is considerable room for improvement, including in governance, management, and transparency of funding flows and community benefits (*11*), the IUCN calls for multiple steps to be taken before decisions are made that restrict or end trophy hunting programs (*7*). Crucially, as African countries call for a "New Deal" for rural communities (*12*) that allows them to achieve the self-determination to sustainably manage wildlife and reduce poverty, it is incumbent on the international community not to undermine that. Some people find trophy hunting repugnant (including many of us), but conservation policy that is not based on science threatens habitat and biodiversity and risks disempowering and impoverishing rural communities.

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SUPPLEMENTARY MATERIAL

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